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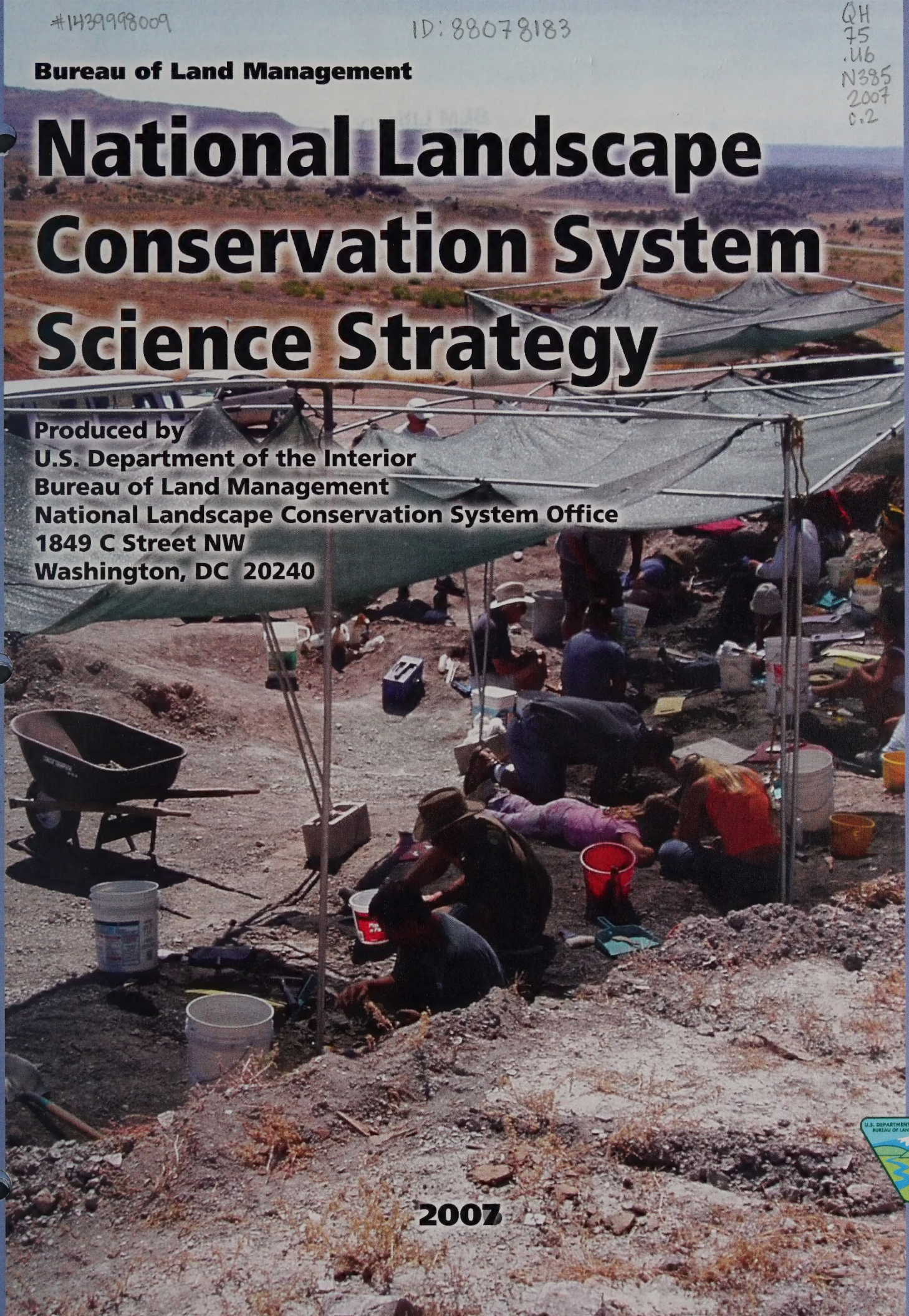
Bureau of Land Management

National Landscape Conservation System Science Strategy



Produced by
U.S. Department of the Interior
Bureau of Land Management
National Landscape Conservation System Office
1849 C Street NW
Washington, DC 20240

2007

Cover Photo: Scientists from the Museum of Western Colorado work at a paleontology dig at Mygatt-Moore Quarry in Rabbit Valley of McInnis Canyons National Conservation Area in Colorado.

Inside Cover Photo: Grand Staircase-Escalante National Monument paleontologist Dr. Alan Titus (left) and volunteer Dave Cox prepare a fossil specimen for exhibit.

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National Landscape Conservation System

Our mission is to conserve, protect, and restore nationally significant landscapes of outstanding cultural, ecological, and scientific values for present and future generations of Americans.

BLM/WO/GI-06/027+6100

Dear Reader

The Bureau of Land Management (BLM) is pleased to present the *National Landscape Conservation System Science Strategy*. This strategy will guide the science program for the National Landscape Conservation System (NLCS) over the next 10 years. The strategy presents goals for science within the NLCS, followed by a series of objectives and actions to achieve those goals. The strategy is based on authorities in the Federal Land Policy and Management Act, Antiquities Act, Wilderness Act, National Trails System Act, Wild and Scenic Rivers Act, and enabling legislation and Presidential proclamations for individual units of the NLCS. It is tiered to the BLM's broader science strategy, while recognizing the unique values of NLCS units.

The NLCS consists of more than 26 million acres that include National Monuments, National Conservation Areas, Wilderness, Wilderness Study Areas, Wild and Scenic Rivers, National Scenic and Historic Trails, and other congressionally designated public lands; all designations are herein referred to as NLCS "units." The NLCS mission is to conserve, protect, and restore these nationally significant landscapes of exceptional cultural, ecological, and scientific values for the benefit of current and future generations. This science strategy focuses on achieving a greater understanding of these values by emphasizing scientific study within NLCS units. The strategy outlines actions to promote science within NLCS units, implement a standard process for permitting and reporting scientific research within the NLCS, integrate scientific findings into management decisions, and use knowledge gained from scientific inquiry for internal and external communication.

The natural resource and social issues within NLCS units are representative of those occurring throughout the BLM. Thus, understanding gained from science conducted on NLCS units can be applied to other public lands, allowing the NLCS to function as an outdoor laboratory for science and best management practices across the BLM. Communicating findings from scientific investigations conducted within NLCS units to both a wider BLM audience and outside the agency will, therefore, maximize the overall utility of these findings across landscapes.

It is our hope that this document will encourage science within the NLCS, effect positive change in managing at the landscape level, and promote communication about science and cooperative conservation throughout the BLM and with the public.

A BLM biologist weighs a golden eagle chick within the Snake River Birds of Prey National Conservation Area along the Snake River Canyon in Idaho.

Recommended by:

Elena C. Daly, ~~Director~~
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James M. Hughes, Acting Director
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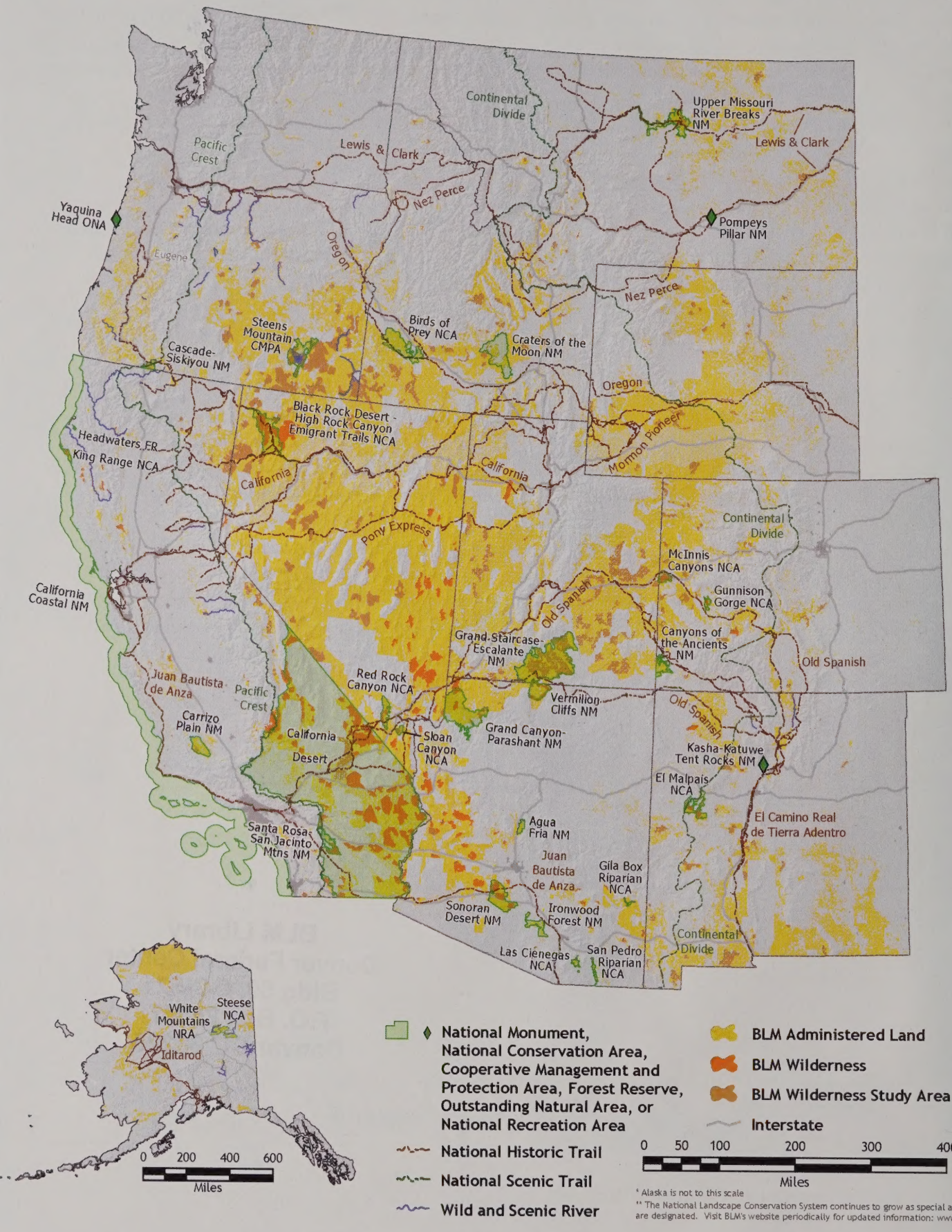


* Alaska is not to this scale

** The National Landscape Conservation System continues to grow as special areas are designated. Visit BLM's website periodically for updated information: www.blm.gov.

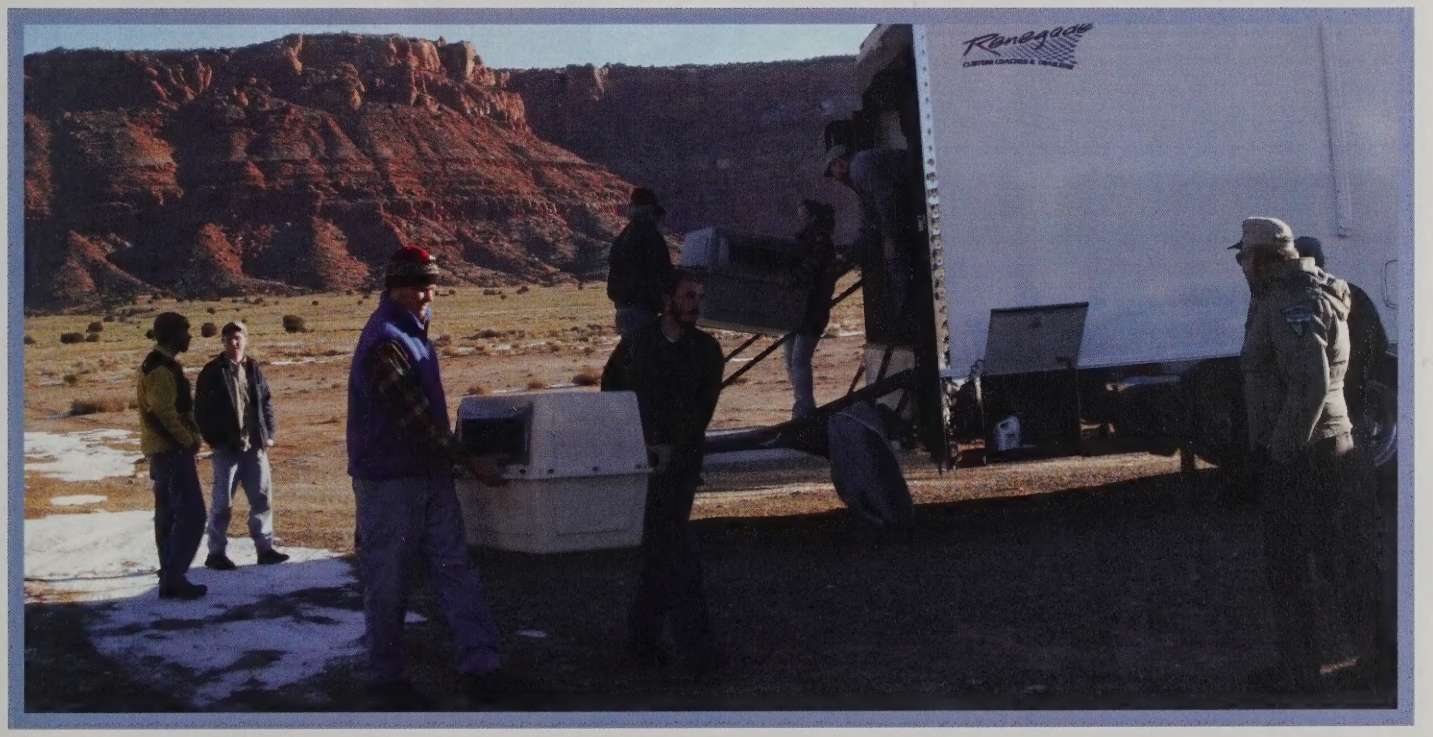
Introduction

The BLM's National Landscape Conservation System comprises BLM-administered public lands that have received special recognition and protection through congressional and Presidential conservation designations. The NLCS science strategy responds to the legal mandate in the enabling legislation and proclamations to promote and foster both basic and applied science by presenting a plan to facilitate scientific understanding of the BLM's NLCS units.

In both the national BLM science strategy (2000) and the NLCS science strategy, the term "science" is defined broadly, including basic and applied research in both natural and social science, as well as inventory and monitoring initiatives. The national science strategy primarily describes an approach for identifying science needed to address management issues, communicating those needs to science providers, and incorporating the results into the decisionmaking process. That framework applies to the NLCS as well.

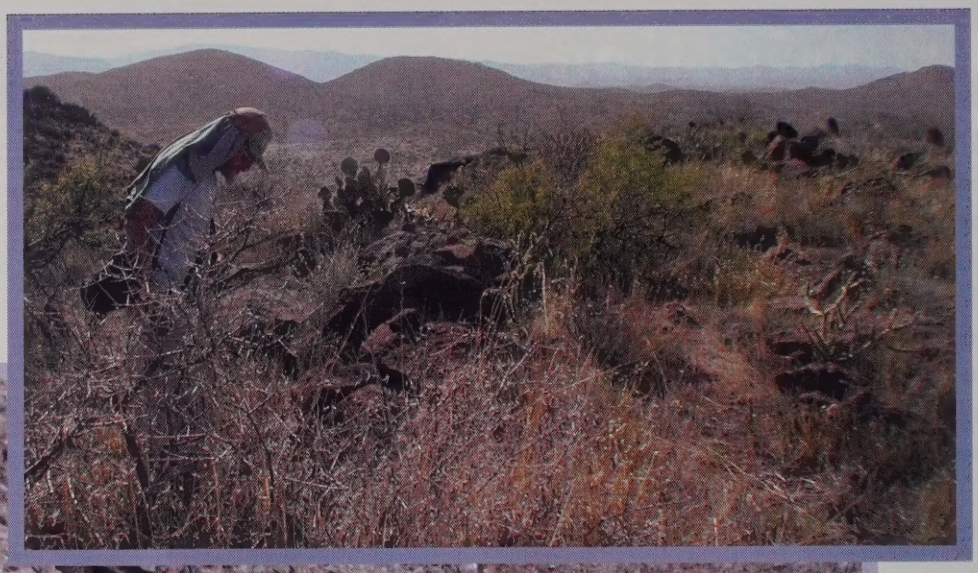
In addition to the BLM's broad mandate to conserve scientific resources under the Federal Land Policy and Management Act, the NLCS has specific congressional and Presidential direction to protect scientific values. The NLCS must protect the scientific and other natural and cultural resources for which its units were designated, which requires an understanding of what and where these values are, what condition they are in, and how best to manage them. Also, because of the increased public interest in these specially designated lands, NLCS units provide significant outreach and education opportunities for which scientific knowledge is integral. These circumstances are addressed by this NLCS science strategy.

To date, many scientific endeavors on NLCS units have been and are being performed without consistent procedures for authorizing, obtaining, or disseminating project results. A systematic method to manage and promote science within NLCS units will increase the efficiency and value of scientific investigation for the NLCS unit, science providers, and the public at large. This strategy establishes a framework for facilitating science within the NLCS, the results of which can be applied across landscapes, promoting cooperative conservation.



Because of its remoteness, in 1996 Vermillion Cliffs National Monument became a long-term release site for the California condor reintroduction program in northern Arizona.

A volunteer from the Arizona Archaeological Society examines rock art near the edge of Silver Creek Canyon in the Agua Fria National Monument. Volunteers have devoted thousands of hours to recording and analyzing prehistoric petroglyphs in the monument.



Professor Scott Hughes, Geosciences Department Chair, Idaho State University, describes rift volcanism for Great Rift Science Symposium participants at South Grotton Spatter Cone Complex in Craters of the Moon National Monument.

NLCS Science Goals and Objectives

The goals of science within the NLCS are to:

- Gain scientific understanding of NLCS resources and landscapes and the benefits they provide the American public
- Apply scientific understanding to management, education, and outreach

The objectives and actions that follow provide the framework for how the NLCS will achieve these goals.

Objective 1: Promote scientific study within NLCS units.

Rationale: NLCS units have been designated by Congress or the President in part for their extraordinary scientific resources. Generating knowledge about natural and social resources of the NLCS is the first step toward achieving an understanding of these treasures. Therefore, projects in the natural and social sciences that take advantage of these resources should be encouraged. Science plans and designated science coordinators/ contacts for NLCS units will serve as the basis for acquiring a scientifically defensible assessment of NLCS resources through a wide range of activities.

Actions

1.1 Develop science plans for individual NLCS units.
Each NLCS national monument (NM) and national conservation area (NCA) will develop a science plan (Appendix A). Plans will be based on four areas of emphasis: 1) scientific investigation of natural, social, and cultural resources referred to in each unit's enabling language, 2) studies that directly provide information to be used in Bureau management decisions, 3) multidisciplinary syntheses of science results for planning and implementation processes, and 4) efforts to communicate scientific findings to the public. All units' science plans will include sections on baseline inventory and monitoring as part of identifying their science needs. NLCS areas other than NM/NCAs may also develop science plans.

1.2 Designate a science contact for each NLCS unit.
Each NLCS unit will designate a contact for science providers who will be responsible for responding to research requests submitted through the new BLM Research Permit and Reporting System (RPRS) (Appendix B). Science coordination responsibilities could range from full-time to collateral duties, depending on need.

1.3 Conduct outreach to science providers.
NLCS science coordinators/contacts, unit managers, and state NLCS program leads will conduct outreach to outside researchers about NLCS science needs. Individual NLCS units will conduct outreach through the BLM RPRS, the Cooperative Ecosystem Studies Units program, and grassroots networking with potential researchers. Outreach can also be conducted through unit-specific or NLCS-wide science symposia, professional and departmental meetings, and the Internet.

Objective 2: Implement a standard process for permitting and reporting scientific research within NLCS units.

Rationale: A consistent process for science providers to learn about science needs, obtain research permits, and report the progress and results of science conducted on public lands will enable the BLM to more effectively and efficiently

interact with our science partners and more accurately report the magnitude and value of scientific activities within the NLCS. A system that streamlines the permitting and reporting process decreases the workload for both science providers and Bureau staff and managers.

Actions

2.1 Provide a central location to access information regarding scientific research on public lands.
The BLM RPRS will provide a venue for science providers to learn about NLCS scientific needs, resources, and contacts. The initial BLM RPRS is being piloted on a subset of NLCS units in fiscal year 2008. The pilot sites will be evaluated and, if successful, the system will be implemented throughout the NLCS and optionally may be deployed Bureauwide. Appropriate Bureau websites (e.g., NLCS units and the BLM science center) will provide a link to the BLM RPRS.

2.2 Monitor research activities to ensure compliance with BLM requirements and help facilitate research project logistics.
Scientists will use the BLM RPRS to apply for permits and report the progress and results of scientific activities within NLCS units. The NLCS science coordinators/contacts will ensure that the researcher has obtained the necessary permits prior to beginning work (e.g., sensitive plant/animal species, cultural resource, and paleontology permits), as well as verify compliance with applicable laws, regulations, Department and Bureau policies, and Executive orders. For example, some NLCS units have specific policies designed to protect the areas' specific values (Appendix C). NLCS staff will then work with the researchers to locate appropriate study sites and will maintain communication with the researcher regarding logistics of the project (e.g., when field workers will be on site, what their plot markers look like, etc.).

2.3 Track scientific activities within NLCS units.
The BLM RPRS will allow scientists to submit the required Investigator Annual Reports online. Report guidelines will be a part of the BLM RPRS. These reports will be part of the database of the objectives and general findings of scientific study conducted within NLCS units.

Objective 3: Communicate the results of scientific study internally and integrate this knowledge into management decisions.

Rationale: Scientific information must be communicated internally to reach our goal of using scientific understanding of NLCS resources to inform management decisions. Scientific understanding gained from science conducted within the NLCS can be applied to other public lands, allowing the NLCS to function as an outdoor laboratory for science and best management practices across BLM landscapes.

Actions

3.1 Facilitate the transfer of scientific information from researchers to the NLCS.
NLCS unit managers will access Investigator Annual Reports for scientific studies performed on public lands through the BLM RPRS. In addition, researchers will provide final reports (including project objectives, methods, data, conclusions, and whether or not the results were peer-reviewed/published) and other peer-reviewed publications to the hosting NLCS unit through the science coordinator/contact and the BLM science center in electronic form. The NLCS offices will also request that all scientists incorporate a technology transfer product. This

can take the form of a short briefing document on the project summarizing how the findings could impact various management issues. Researchers can also participate in informal presentations with BLM staff to discuss their research in the context of current management issues.

3.2 Facilitate periodic syntheses of scientific topics of interest.
NLCS units will help facilitate synthesis of current knowledge about especially relevant scientific issues. For example, state NLCS leads, unit managers, and unit science coordinators/contacts will organize opportunities for meetings, workshops, and/or science symposia. Units will work in close coordination with adjacent BLM field offices and state, regional, and national science coordinators to plan and leverage support for such opportunities.

3.3 Issue guidelines for interpreting and integrating scientific information into decisionmaking.
Policy will be created using BLM examples, to help managers and staff complete the cycle of integrating science into their decisionmaking process. These recommendations will tier from the BLM's broader science strategy.

Objective 4: Communicate scientific findings externally.

Rationale: Informing the general public, local communities, researchers and institutions, and other land managers about the results of scientific activities within NLCS units will foster appreciation for and enjoyment of the landscape in which they live and work and promote cooperative conservation.

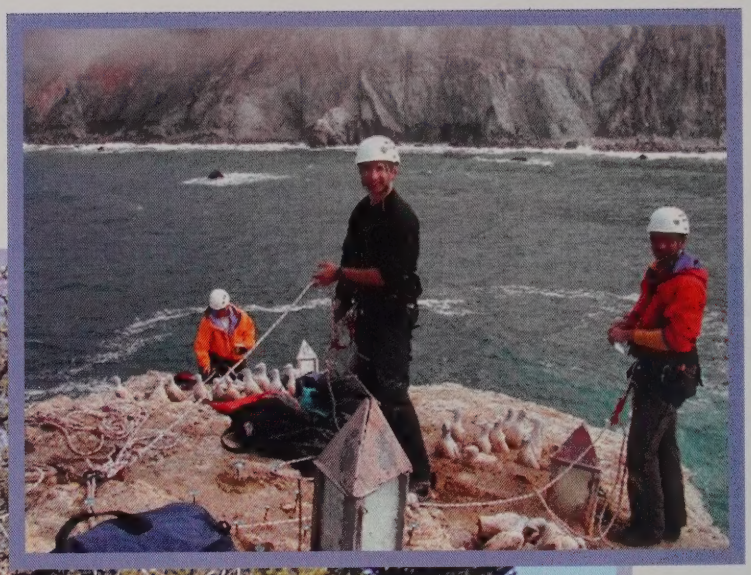
Actions

4.1 Use knowledge gained from science within NLCS units in interpretive activities.
Science highlights will be incorporated into interpretive activities (e.g., visitor center displays, road- and trailside kiosks, guided hikes, brochures, and websites) to enhance explanations of NLCS units' special features. As projects are completed, new information will become available and incorporated into interpretive activities. Some science projects may even allow for visitors to work side by side with researchers, helping visitors better understand and appreciate the scientific process.

4.2 Provide scientific information and opportunities to educational institutions.
NLCS units will provide such services as outdoor classrooms (e.g., www.handsontheland.org), field trip and volunteer opportunities, hands-on demonstrations of how to collect and interpret various types of data, and research prospects (for graduate and undergraduate students, such as GeoCorps). Web-accessible lesson plans and classroom satellite broadcasts that focus on science from NLCS units, such as Share the Adventure!, will help make NLCS science available to students across the country.

4.3 Share scientific information with local communities and the general public.
Forums will be provided in which residents of local/gateway communities can learn about NLCS science. Forums could include lecture series, field tours, opportunities to volunteer with researchers, and newsletters. Presenting information to communities will help facilitate transitions associated with rapid change throughout the West. Scientific findings of broader significance will be posted on BLM websites.

Fish and Wildlife Service biologists use common murre decoys to lure the highly social birds back to the rocks within the California Coastal National Monument. These rocks were important predecline locations for murre breeding colonies.



A researcher from Northern Arizona University/Ecological Restoration Institute collects data for an ongoing pinyon-juniper research project within the Grand Canyon-Parashant National Monument.

Appendix A:
NLCS Unit Science Plan Outline

Purpose

Outline how the particular NLCS unit will help to achieve the overall NLCS science goals to: 1) gain scientific understanding of NLCS resources and landscapes, and 2) apply scientific understanding to management, education, and outreach.

Standard NLCS Unit Science Plan Components

1. **Identify the unit's scientific mission**
    - List the science values identified in the unit's designation
    - Summarize the baseline condition of natural and/or cultural resources
    - Enumerate the unit's resource management plan connections, drivers, and requirements
2. **Identify science needs**
    - Prioritize internal science needs including baseline inventory and monitoring (e.g., natural and cultural resources, demographic and economic information)
    - Describe opportunities and needs for scientific research
3. **Outline the strategy to meet science needs**
    - Identify the unit science coordinator/contact
    - Identify current and potential science providers, partners, and collaborators
    - Outline a plan for completing baseline inventories
    - Develop a long-term monitoring strategy
    - Detail the plan to promote science within the unit
    - Link unit science projects to local, regional, and national efforts
    - Arrange for the use of the new BLM RPRS
4. **Specify a strategy for integrating scientific understanding into management decisions**
    - Develop a strategy for transferring information from researcher to staff
    - Identify opportunities to share especially relevant scientific information among scientists, managers, and staff
    - Arrange for the next stage of the resource management plan (development, implementation, or evaluation)
    - Ensure compliance with legislative, statutory, and regulatory factors (e.g., National Environmental Policy Act)
5. **Describe how scientific findings will be delivered to the public**
    - Identify interpretive activities related to science
    - Specify and post/advertise opportunities for educational institutions
    - Develop plans for sharing information with other agencies/land managers
    - Propose specific outreach to local communities and broader audiences
6. **Describe existing scientific projects**
    - List project title, contributors, a brief description, and status (planned, in progress, completed, etc.) for current science activities

Appendix B:
The BLM Research Permit and Reporting System

The NLCS is working in partnership with the National Park Service (NPS) to adapt their Research Permit and Reporting System (RPRS) for the BLM and ensure the two systems are compatible.

Major Features Found on the BLM RPRS

- Information about BLM research permit application requirements and field work restrictions
- Web link and science coordinator contact information for each NLCS unit
- Searchable database of NLCS units' science needs and opportunities
- Online application for a permit to conduct research within the NLCS
- Online submission of Investigator Annual Reports for scientific studies conducted on public lands
- Searchable database of the objectives and findings (as reported in the Investigator Annual Reports) of science previously conducted within the NLCS

Benefits for the BLM

- Supports the President's electronic government (e-gov) initiative
- Creates a user-friendly, centralized forum to communicate BLM research needs to science providers
- Provides managers, planners, and interdisciplinary teams easy access to science reports that will be used in decisionmaking
- Allows the BLM to monitor research activities, ensuring projects are in compliance with laws, regulations, land use plan decisions, and National Environmental Policy Act requirements
- Decreases workloads for field staff through task automation and a reduction in the number of direct inquiries regarding science needs and opportunities
- Enhances the BLM's profile within the science community, thereby increasing the BLM's capacity to leverage funding through partnerships with researchers
- Provides useful information for BLM education, community outreach, and interpretation efforts
- Facilitates the BLM's ability to gather information, imposing fewer data calls on field offices
- Promotes consistency within the Department of the Interior

Benefits for the Research Community

- Provides a centralized access point to learn about science needs and opportunities across BLM jurisdictions

- Increases researchers' abilities to interact with BLM staff, locate study areas in the most appropriate locations, and develop projects most useful to the BLM

- Provides quick access to previous and ongoing projects, fostering collaboration between researchers and reducing duplication of studies

- Streamlines permitting and reporting for projects undertaken at multiple sites, across multiple years, or across jurisdictions

Current Plans for the BLM RPRS

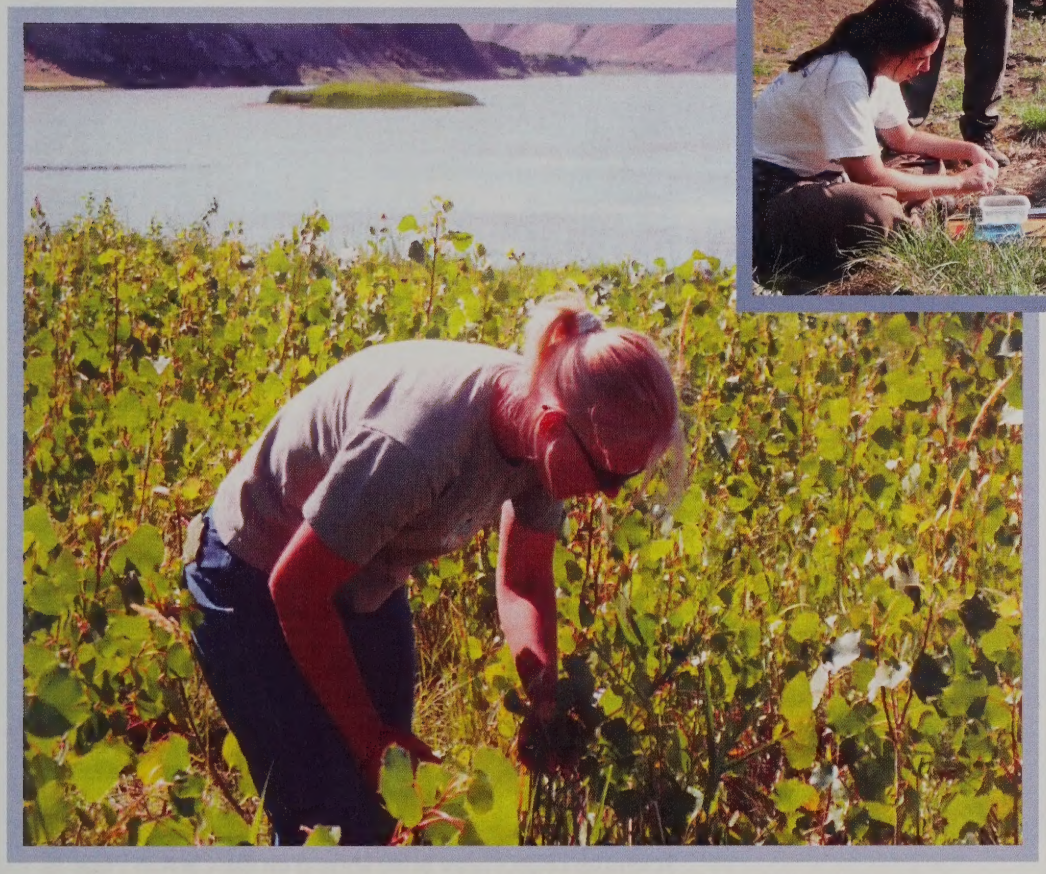
The BLM RPRS is being piloted on a subset of 10 NLCS units. Pilots include: Agua Fria National Monument, San Pedro Riparian National Conservation Area, Aravaipa Wilderness, Headwaters Forest Reserve, California Coastal National Monument, Gunnison Gorge National Conservation Area, Snake River Birds of Prey National Conservation Area, Upper Missouri Breaks National Monument, Steens Mountain Cooperative Management and Protection Area, and Grand Staircase-Escalante National Monument.

- Fiscal Year 2008 – Test the BLM RPRS in a live environment (1-year pilot)

- Fiscal Year 2009 – Evaluate tests and prepare to expand to all remaining NLCS units

- Fiscal Year 2010 – Evaluate the BLM RPRS for implementation Bureauwide

Scientists conduct vegetation transects as part of a project examining the response of butterfly diversity to grazing in the Cascade-Siskiyou National Monument in Oregon. One hundred fifteen butterfly species have been catalogued in the monument.



A BLM range technician counts cottonwood saplings near Pablo Rapids in Montana as part of the cooperative cottonwood study between BLM and the U.S. Geological Survey in the Upper Missouri River Breaks National Monument.

Appendix C:
Conducting Research in BLM-Managed Wilderness, Wilderness Study Areas, and Wild Rivers

The BLM encourages natural and social scientific research on all NLCS lands. Certain units such as Wilderness, Wilderness Study Areas (WSAs), and Wild Rivers have special requirements that set them apart from other types of public land.

In general, a researcher may remove or disturb natural resources in BLM Wilderness, WSAs, and Wild Rivers if project impacts preserve wilderness character. Ordinarily, this means research must be accomplished using nonmotorized hand tools and cause only minimal surface disturbance.

Wilderness and Wild Rivers

Researchers are encouraged to conduct scientific investigations that are dependent on the natural setting of Wilderness and Wild Rivers. The BLM may consider exceptions to some of the following prohibitions on a case-by-case basis.

Researchers are generally prohibited from:

- Building temporary roads, aircraft landing strips, heliports, or helispots
- Using motorized equipment; or motor vehicles, motorboats, or other forms of mechanical transport
- Landing aircraft or dropping or picking up any material, supplies, or people
- Building structures or installations
- Cutting trees

Wilderness Study Areas

Researchers are generally prohibited from:

- Driving off designated routes of travel
- Creating surface disturbance that requires reclamation (recontouring topography, replacing topsoil, or restoring native plant species and cover)
- Building temporary roads, aircraft landing strips, heliports, or helispots
- Landing aircraft or dropping or picking up any material, supplies, or people
- Building structures or installations
- Cutting trees

Scientists collect fairy brine shrimp on the Carrizo Plain National Monument in California as part of the vernal pool monitoring projects.

BLM staff take global positioning system readings at Kasha-Katuwe Tent Rocks National Monument.

Oregon Archaeological Society volunteers pick bone, stone, and fire hearth charcoal from screens at the Mortar Riddle Site in the Steens Mountain Cooperative Management and Protection Area.

Paleontologists from the Smithsonian Institution examine specimens in the Fossil Forest Research Natural Area in New Mexico.

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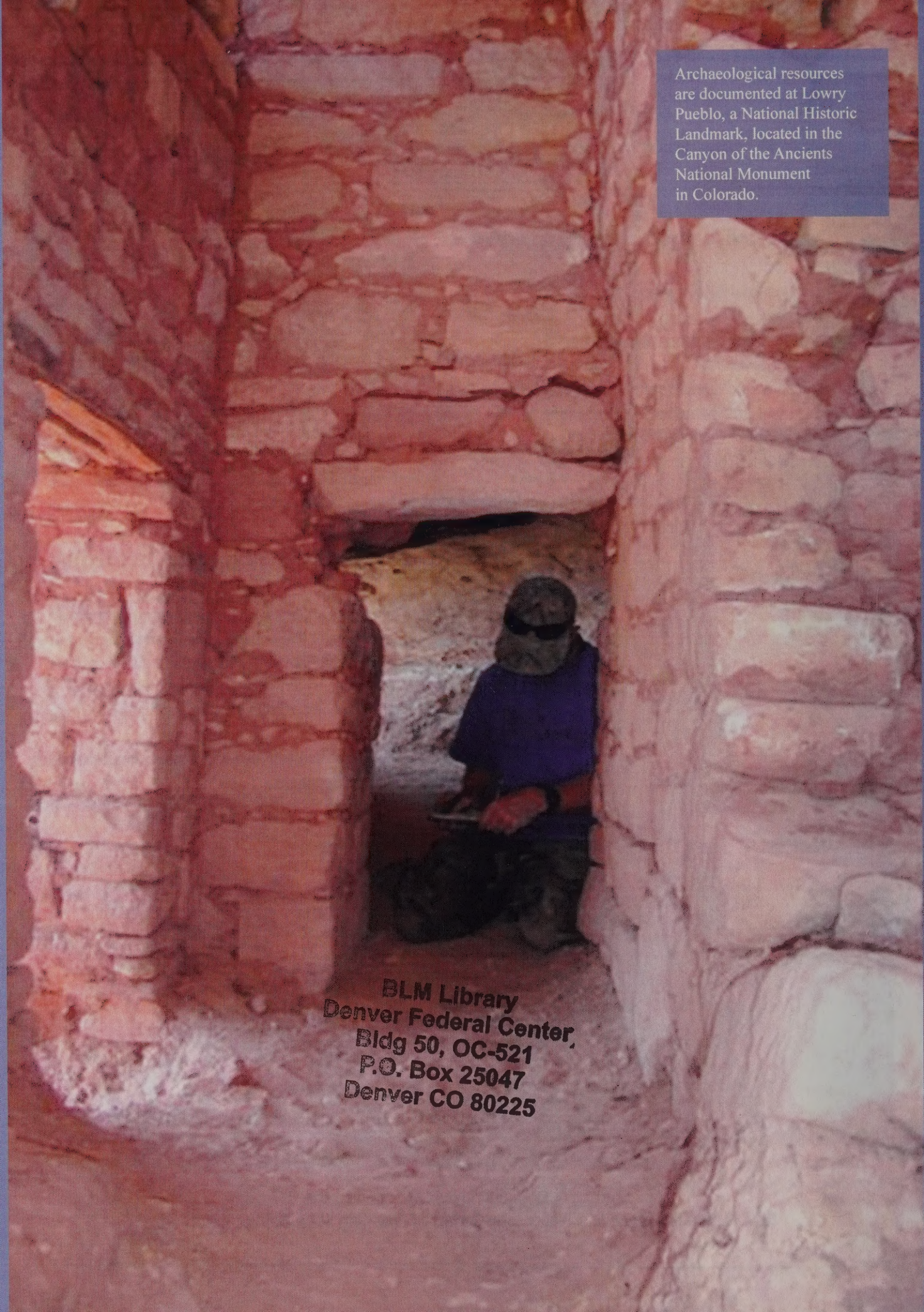

Archaeological resources are documented at Lowry Pueblo, a National Historic Landmark, located in the Canyon of the Ancients National Monument in Colorado.

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